Clean Energy Manufacturing Innovation Institutes

Presented to the Biomass Research and Development Technical Advisory Committee

May 20, 2015
Manufacturing Innovation Institutes

- Leverage effectiveness of regional, public-private partnerships to spur innovation and competitiveness of U.S. manufacturing

- Institutes form the core of the National Network for Manufacturing Innovation (NNMI); key tenets:
  - Develop critical technologies in TRL/MRL 4-7 range that will be used
  - Become self sustaining
  - Develop and educate an advanced manufacturing workforce
  - Bring together industry, universities and community colleges, federal agencies, and state & local governments

- Administration’s Vision: up to 45 Institutes in 10 years
DOE Topic Development for Potential Institutes

Strategic Plans: OSTP, DOE, EERE, CEMI

AMO: Technical Reviews and Industry Group

DOE Internal: CEM-TT Working Groups

External: CEMI Workshops, AMP 2.0, AMNPO/DOD

Open RFIs, Regional Dialogs, White Papers, & Reviews

Preliminary Topic Identification

Topical Workshops, & Focused RFIs

Topic Development

Topical RFI

Internal & External Workshops

FOA

Solicitation

Competitive Solicitation & Teaming Board

Execution

Subject Matter Expert Review Panels

External Inputs
## NNMI Topic Identification Criteria for DOE

### EERE Core Questions

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<tr>
<th>High Impact:</th>
<th>Application to NNMI Topic Selection</th>
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<tr>
<td>Why is this a high-impact problem?</td>
<td>• What is manufacturing challenge to be solved?</td>
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<td>How would this technology development transform the marketplace?</td>
<td>• If solved, how does this impact clean energy goals?</td>
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<td>• What is manufacturing challenge to be solved?</td>
<td>• If solved, who will care and why specifically?</td>
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<th>Additionality:</th>
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<td>How will EERE Funding make a large difference relative to what the private sector (or other funding entities) is already doing?</td>
<td>• Who is supporting the fundamental low-TRL research &amp; why wouldn’t they support mid-TRL development?</td>
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<td>• Who is supporting the fundamental low-TRL research &amp; why wouldn’t they support mid-TRL development?</td>
<td>• Who else might fund this mid-TRL development &amp; how might EERE/AMO support catalyze this co-investment?</td>
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<th>Openness:</th>
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<td>How will EERE make sure to focus on broad problems and be open to new ideas, new approaches, and new performers?</td>
<td>• Has this mid-TRL Manufacturing Challenge been Stated Broadly?</td>
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<td>• Is there Fertile low-TRL Scientific Base to Address the Challenge?</td>
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<td>• Has a Broad Set of Stakeholders been Engaged in Dialogue?</td>
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<th>Enduring Economic Benefit:</th>
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<td>How will EERE funding result in enduring economic benefit to the US, particularly the manufacturing sector?</td>
<td>• Would this Manufacturing Challenge Impact More than One Clean Energy Technology Application?</td>
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<td>• Is Industry Currently Trying to Identify Solutions?</td>
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<th>Proper Role of Government:</th>
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<td>How does EERE funding represent a proper and high-impact role of government versus something best left to the private sector?</td>
<td>• What is the National Interest? What is the Market Failure? (Why Would Industry Not Solve this By Itself?)</td>
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<td>• Is there a Pathway for Federal Funding to End &amp; What are the Metrics for This Transition?</td>
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<td>• Is there Large Potential for Follow-On Funding, &amp; What are the Stage Gates to Follow-On Support?</td>
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<th>+ Appropriate Mechanism</th>
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Clean Energy Manufacturing Innovation Institutes

- PowerAmerica: Next Generation Power Electronics Manufacturing Innovation Institute, led by North Carolina State University
- Institute for Advanced Composites Manufacturing Innovation, in negotiation with team led by the University of Tennessee
- Smart Manufacturing: Sensors, Controls, Platforms, and Models for Manufacturing, funding opportunity announcement to be released 2015
DOD Current and Planned Institutes

- America Makes
- Lightweight Innovations for Tomorrow (LIFT, formerly LM3I)
- Digital Manufacturing and Design Innovation

- Integrated Photonics
- Flexible Hybrid Electronics
- Revolutionary Fibers and Textiles
Institute for Advanced Composites Manufacturing Innovation (IACMI)

Federal investment will catalyze a composites ecosystem in the heart of US manufacturing

$70M - DOE
$189M - Other *
122 - Member Consortium
6 States
Strong Leadership
5 Focus Areas

CFRP Production Cost - 50%
CFRP Embodied Energy Savings - 75%
GHG Avoidance - 50%
Production Capacity - 50%
Jobs - 25%

*States are significant contributors

Institute announced on January 9, 2015
Clean Energy Manufacturing Innovation Institute Goals

- Develop advanced manufacturing technology that is used
- Be substantially self-sustaining after 5 years
- Train an advanced manufacturing workforce

Enrich the innovation ecosystem
Concluding Remarks

• The Administration has awarded or announced nine Institutes for Manufacturing Innovation (DOE – 3, DOD – 6)

• DOE uses a rigorous process to select Institute topics that includes inputs from industry and universities; the DOD process is similar

• Institute goals are well defined
  - Develop advanced manufacturing technology that is used
  - Be substantially self-sustaining after 5 years
  - Train an advanced manufacturing workforce
  - Enrich the innovation ecosystem